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ABSTRACTS

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(Pages refer to the Japanese originals of this volume unless otherwise noticed)

On the Stimulant for Cane Sugar Formation in Plants. (IV and V)

(pp. 1125~1129)

By Tetutarō TADOKORO.

(Biochem. Lab., Faculty of Sci., Hokkaido Imp. Univ.;
Received Nov. 16, 1939.)

Phosphoric Acid Absorption of Soils in Tyosen. IV.

(pp. 1130~1134)

By MISU-Hideo.

(Agricultural Experiment Station, Government General of Tyosen;
Received Aug. 28, 1939.)

On the Optical Properties of the Fermentation Lactic Acids.

(pp. 1135~1142)

By Hideo KATAGIRI and Shosuke MURAKAMI.

(Agr. Chemical Laboratory, Kyoto Imperial University; Received Oct. 30, 1939.)

(Part VIII) The Optical Specificities of Phosphoglycerates Decomposed by Lactic Acid Bacteria.

When the maceration extract of dried beer yeast or the resting cells of various kinds of lactic acid bacteria were added to Na *dl*-2-phosphoglycerate or Na *dl*-3-phosphoglycerate solutions with toluene, and kept at 26~30° for 0.5~

2.5 hr., the yeast maceration extract and most of the bacterial cells were found to show complete optical specificities, and pyruvic acid was always found as the product of decomposition.

With the yeast maceration extract, $d(+)$ -2- and $d(-)$ -3-phosphoglycerates were decomposed, while *Leuconstoc mesenteroides* var. *Sake* (*l*-acid former) decomposed $d(+)$ -2- and $l(+)$ -3-phosphoglycerates and *Lactobacillus Sake* (*d*-acid former) attacked selectively $l(-)$ -2- and $d(-)$ -3-isomers: the optical antipodes of the phosphoglycerates decomposed by *l*-acid former.

No optical specificity was found with *Lactobacillus plantarum* (*dl*-acid former), since all the forms of these phosphoglycerates were decomposed by the bacterial cells.

Experiments were carried out with the optically active 2- and 3-phosphoglycerates prepared from the *dl*-compounds by the action of *l*- or *d*-acid former.

The selective decompositions revealed by the bacterial cells were more clearly verified, i. e. $l(-)$ -2- or $d(-)$ -3-phosphoglycerates and $l(+)$ -3-phosphoglycerate were never decomposed by *l*- and *d*-acid formers respectively.

In contrast with the case of *d*-acid former mentioned above, $d(+)$ -2-phosphoglycerate was selectively decomposed by muscle extract which would produce *d*-lactic acid, whereas exactly the same selective decomposition of 3-phosphoglycerate was observed by the two *d*-lactic acid formers.

Therefore Embden-Meyerhof's scheme of lactic acid fermentation based upon the experiments with muscle extract, would at least be necessary to correct the optical property of 2-phosphoglycerate in the case of the fermentation with lactic acid bacteria.

Racemic form of phosphoglycerate was always recovered from the solution in which *dl*-acid former had been added to any one of the optically active components of 2- or 3-phosphoglycerates, therefore it is suggested that racemiasse could again catalyse racemization of 2- and 3-phosphoglycerates as was already observed by us with lactic acid.

(Part IX) The Action of Racemiasse upon Phosphoglycerates.

The racemization of $l(-)$ -2-phosphoglyceric acid effected by the resting cells of *Lactobacillus plantarum* (*dl*-acid former) was found to be due to racemiasse, since the racemization was never observed with the maceration extract of dried cells of the same *dl*-acid former in which racemiasse had been completely destroyed.

Exactly the same selective decomposition of phosphoglycerates was observed with the maceration extract of the *dl*-acid former as was observed with a *l*-acid former (*Leuconostoc*) with which $d(+)$ -2- and $l(+)$ -3-phosphoglyceric acids were decomposed, while no optical specificity was found with resting cells of the same *dl*-acid former.

Therefore it was ascertained that the action of racemiasse was not limited to

lactic acids, since the racemization of 2- and 3-phosphoglycerates was effected by the enzyme.

On the Solonetz Soil in Manchuria.

(pp. 1143~1148)

By R. KAWASHIMA.

(Agr. Chem. Laboratory, Kyushu Imp. University; Received Nov. 16, 1939.)

A Solonetz type soil is distributed along the Heisai line in the alkali soil region in Central Manchuria. The soil profile now concerned, has a loose and friable A layer, and a very hard large columnar B layer, although not so sharply structured, and an extremely hardened C layer. The texture of A layer is loamy sand, and those of B and C layers are respectively sandy loam and loam. Therefore, the illuviation of clay particles from above is manifested.

The chemical properties of these three layers are summarised as follows:—

The pH value, water soluble ash and calcium carbonate content are given in Table I.

Table I. The pH value etc.

Layer	Thickness cm	pH Value	Water Soluble Ash %	CaCO ₃ %
A	30	8.64	0.020	1.585
B	25	9.86	0.218	3.995
C		10.27	0.252	7.812

As in Table I, the pH value and water soluble ash content of A layer are low, but those of B and C layer are very high. All of the layers contain calcium carbonate.

The water soluble salts in the extract of soil-water ratio 1 : 5 are determined and given as milligram equivalent per 100 gram soil.

Table II. Water Soluble Cations and Anions.

Layer	Anions (mg. eq. per 100 g Soil)					Cations (mg. eq. per 100 g Soil)				
	SO ₄	Cl	CO ₃	HCO ₃	Total	Ca	Mg	K	Na	Total
A	0.18	0.04	0.19	0.98	1.39	0.35	0.35	0.05	0.54	1.29
B	0.50	0.30	0.77	2.54	4.11	0.17	0.21	0.27	3.64	4.29
C	0.67	0.29	1.34	2.59	4.89	0.38	0.21	0.30	3.85	4.74

As in Table II, the concentration of soluble salts in A layer is much lower than in B and C layer. The salts in B and C layer are composed principally of carbonate and bicarbonate of sodium.

The exchangeable cations determined by Puri's method are given in Table

III as milligram equivalent per 100 gram soil.

Table III. Exchangeable Cations.

Layer	mg. eq. per 100 g Soil				Percentage of Total		
	Ca	Mg	K+Na	Total	Ca	Mg	K+Na
A	7.07	2.31	0.22	9.60	73.7	24.1	2.3
B	4.21	2.47	4.74	11.42	36.9	21.6	41.5
C	2.09	2.21	7.40	11.70	17.9	18.9	63.2

As in the above table the exchange complex in A layer is well saturated with divalent cations, but in B layer the proportion of monovalent cations is increased surprisingly, and still more in C layer.

On the Selection of Grape Varieties for Wine Making. Part II.

(pp. 1149~1157)

By Zembei KAWAKAMI and Takeji HASEGAWA.

(Iwanohara Vineyard; Received Nov. 13, 1939.)

The present study is the continuation of previous work reported by H. Kawakami and S. Matumiya.⁽¹⁾

The grapes used in the present experiments are known varieties and crosses of European and American origin besides new crosses obtained by Z. Kawakami in Iwanohara vineyard, Niigata Prefecture. They are as follows:—

a) Fifty three known varieties of foreign origin and two Japanese native varieties, i. e., Concord, Adirondack, Unknown spec. No. 1, Kenena, Niagara, Prentiss, Bailey, Jona, Lady Washington, Brighton, Excelsior, Telegraph, Janesville, Beacon, Vergennes, Amber Queen, Agawam, Krueger, Bertrand, R. W. Munson, Atoka, Herbert, Admirable, Early Concord, Luckyne, Eaton, Husmann, Universal, Ives, Sado native grape, Cynthiana, Hybrid Franc, Jack, Wyoming Red, Elvira, Kôsyû, Big Extra, Herbemont, Black Sarara, Pierce, Isabella, Norton, Early Purple, W. B. Munson, Mills, Governor Ross, Weisser Steinschiller, Noah, Fern Munson, Big Hope, Highland, Hermann, Great Cluster, Newman.

b) Ten Z. Kawakami's new crosses, i. e., Big Extra × Folle Noire, Beacon × Alicante, Big Extra × Folle Noire, No. 5833, No. 5788, No. 5778, Bailey × Zinfandel No. 1, No. 1102 M × R, No. 503.

The varieties which gave wines of rather high quality are as follows:—Adirondack, Unknown sp. No. 1, Bailey, Big Extra × Folle Noire No. 3, No. 5788, Beacon, Brighton, Krueger, Herbert, Admirable, Eaton, Husmann, Cynthiana, Black Sarara, No. 1102 M × R and Newman.

(1) H. Kawakami and S. Matumiya: This Journ., 14, 1437 (1938).

The Studies on Bios. Part II.

(pp. 1158~1160)

By Nobusada OKOTI.

(Agricultural Chemical Laboratory, Faculty of Agriculture,
Tokyo Imperial University; Received Nov. 11, 1939.)

The bios content in oryzanin extract, oryzanin filtrate, oryzanin precipitate, malt and egg yolk has been studied.

On the Hydrolysis of Fats and Fatty Acid Esters (4).

(pp. 1161~1172)

By Toyoki ONO.

(Chemical Laboratory of the Fish Meal Association of Japan; Received Nov. 17, 1939.)

I. Influence of Free Fatty Acids on Lipase Action.

The action of ricinus lipase was inhibited by fatty acids in the following order—the higher unsaturated fatty acids from sardine oil, capric acid, ricinoleic acid, palmitic acid and oleic acid. Especially the higher unsaturated fatty acids attacked ricinus lipase most strongly, but there was no influence on pancreas lipase.

II. Influence of Oxidised Oil and Hydrogen Peroxide on Lipase Action.

The oxidised perilla oil prepared by heating through the current of air, "blown oil", was less hydrolysed by ricinus lipase and hydrogen peroxide stopped completely the activity of lipase. On the contrary, pancreas lipase was not at all influenced by these two substances.

From these facts, I assume that the oxidised oils being less hydrolysed by ricinus lipase may be due to the inhibition by hydrogen peroxide produced from the peroxide compounds in oxidised oil.

III. Influence of the Amount of Water on Hydrolysing Power.

The amount of water used on emulsifying oil has a great influence on the hydrolysis of fats and oils. The suitable condition to make constant the value of "K" (the reaction velocity coefficient) is to use 5~8 cc. of water and 0.2g of fat.

IV. Influence of Organic Solvents.

In 30% glycerin solution, the action of pancreas lipase was diminished to 50 per cent. Alcohol inhibited in concentrations higher than 10 per cent and acetone did not inhibit but seemed to activate in the concentration of 10 per cent.

On Alcoholic Fermentation of Acorn, Saccharified by Sulphuric Acid.

(pp. 1173~1178)

By Seisaku SUGIZAKI.

(Agricultural Chemical Laboratory, Department of Agriculture,
Tokyo Imperial University; Received Nov. 2, 1939.)

Studies on the Components of the Bark of *Rhamnus japonica* (4).

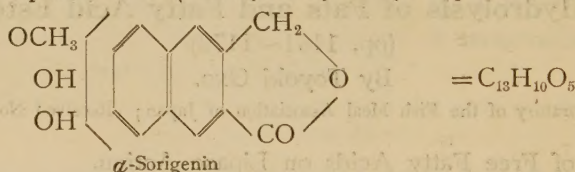
Determination of the Nucleus of α -Sorigenin.

(pp. 1179~1182)

By Ziro NIKUNI and Hiroshi HAYASHI.

(Agr. Chem. Laboratory, Tokyo Imp. Univ.; Received Nov. 27, 1939.)

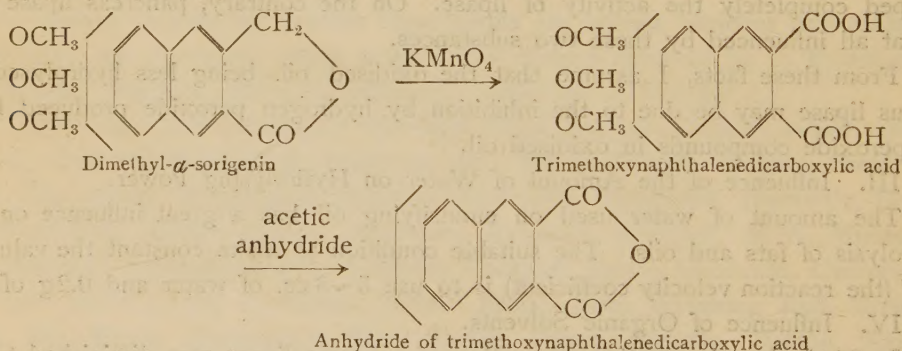
In the previous report [Bull. Agr. Chem. Soc. of Japan: **15**, 43 (1939)], one of the authors deduced that the nucleus of α -sorigenin may be the lactone of 3-hydroxymethyl- β -naphthoic acid (or 3-hydroxymethyl-naphthalene-2-carboxylic acid).



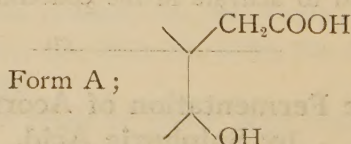
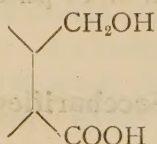
Now we confirmed that conclusion more decidedly from the following results.

1) On the oxidation of dimethyl- α -sorigenin with $KMnO_4$ in alkaline solution, trimethoxynaphthalenedicarboxylic acid is formed; yellowish plates melting at $258\sim 261^\circ$, soluble in alcohol, hexane, 50% alcohol, alkaline solution and insoluble in hot water and acetic ether.

Boiling this dicarboxylic acid with acetic anhydride, the anhydride of this acid is formed as yellowish fine needles, m.p. $263\sim 264^\circ$. Contrary to dicarboxylic acid, this anhydride is insoluble in alcohol and soluble in acetic ether.



From these facts the $COOH$ groups must be in *o*-position to each other and α -sorigenin must be the lactone of the form A.



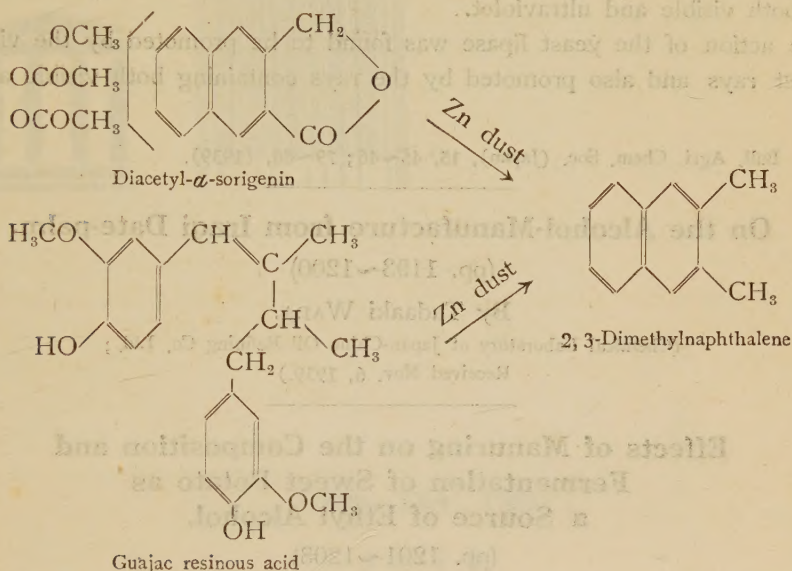
2) Comparison of the zinc dust distillation product from diacetyl- α -sorigenin with pure 2,3-dimethylnaphthalene.

As reported before, the author obtained by the zinc dust distillation of diacetyl- α -sorigenin, fine colourless crystals with m.p. $90\sim 96^\circ$, and confirmed it as 2,3-dimethylnaphthalene from the results of analysis and absorption spectrum.

But the yield was too small to permit us to purify it completely to its real melting point (104°).

So we obtained pure 2,3-dimethylnaphthalene by the zinc dust distillation of guajac resinous acid and compared its absorption spectrum with that of the above crystals.

The two spectra coincide very well on the main absorption maxima $288\text{ m}\mu$, $276\text{ m}\mu$, $266\text{ m}\mu$, and $253\text{ m}\mu$.



From the above results we decide that the nucleus of α -sorigenin is the lactone of 3-hydroxymethylnaphthalene-2-carboxylic acid.

The authors express their sincere thanks to Prof. B. Suzuki for his kind guidance throughout this work.

The Influence of Monochromatic Lights on the Action of Enzymes. [Report XXVI~XXIX]

Especially on the Influence of Ultraviolet Rays.

(pp. 1183~1192)

By Reitaro MURAKAMI.

(Agricultural College, Utunomiya; Received Oct. 10, 1939.)

In order to further investigate the influence of ultraviolet rays on the enzymes in the yeast, the enzyme solutions containing saccharase, amylase, proteinase and lipase respectively were irradiated by ultraviolet rays from "Vim Ray" blue lamp. The treatments after the addition of the enzyme solutions into the substrates were the same as in the author's previous papers.⁽¹⁾

In this experiment, the action of the yeast saccharase was found to be inhibited by ultraviolet rays and promoted by the visible rays. The saccharase was promoted at first under the influence of the rays containing both ultraviolet and visible, but the action of the enzyme was finally inhibited,

The amylase and proteinase were influenced very slightly by the action of lights. However, the action of the yeast amylase was found to be slightly inhibited by ultraviolet rays. The amylase was also inhibited at first by the visible rays and the rays containing both ultraviolet and visible, but the strength of enzyme was later regained. The action of the yeast proteinase was found to be promoted by the visible and ultraviolet rays and also promoted by the rays containing both visible and ultraviolet.

The action of the yeast lipase was found to be promoted by the visible and ultraviolet rays and also promoted by the rays containing both visible and ultraviolet.

(1) Bull. Agri. Chem. Soc. (Japan), **15**, 45~46; 79~80, (1939).

On the Alcohol-Manufacture from Iraqi Date-palm.

(pp. 1193~1200)

By Tadaaki WADA.

(Chemical Laboratory of Japan-China Oil Refining Co. Ltd.;
Received Nov. 6, 1939.)

Effects of Manuring on the Composition and Fermentation of Sweet Potato as a Source of Ethyl Alcohol.

(pp. 1201~1208)

By Seisaku SUGIZAKI.

(Agricultural Chemical Laboratory, Department of Agriculture,
Tokyo Imperial University; Received Nov. 4, 1939.)

Biochemical Studies on Bakanae Fungus of the Rice. Part IV.

The cultural condition for producing gibberellin
or fusaric acid. I.

(pp. 1209~1220)

By T. YABUTA, Y. SUMIKI, and S. UNO.

(Agr. Chem. Lab., Tokyo Imperial Univ.; Received Nov. 13, 1939.)

Studies on the Yeasts Found in "Miso" (Supp. Contributions.) Part III. Classification.

(pp. 1221~1232)

By Masatoshi MOGI.

(The Brewing Laboratory of Noda Co. Ltd., Noda-Machi, Chiba-Ken, Japan;
Received Nov. 21, 1939.)